



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/527,207

11/07/2005

Lutz Weber

BE-149PCT

2294

40570

7590

12/08/2008

FRIEDRICH KUEFFNER

317 MADISON AVENUE, SUITE 910

NEW YORK, NY 10017

EXAMINER

MYERS, JESSICA L

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

12/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/527,207 | Applicant(s) WEBER, LUTZ | |
| | Examiner JESSICA L. MYERS | Art Unit 3746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/18/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment and arguments filed on 8/18/08 under 37 CFR 1.131 have been entered and considered.

2. The amendment filed 8/18/08 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Claim 14 has been amended to include a "disk place" on the base part of the apparatus. However, the specification makes no mention of a disk place, and no disk place is pointed out in the drawings

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Art Unit: 3746

4. Claims 1-8, 11, 12, and 17-21 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,514,742 to Suga et al. (Suga et al.).

In Reference to Claim 1

Suga et al. teach a micropump (see figure 2) with a pump membrane (wall (12)) which can be moved by modifying the volume of a pump chamber (pressure chamber (13)) which is adjacent to the pump membrane and a base part (printer head (10) serves as a base for mounting the wall), also comprising two valves (first and second fluid control means (21 and 22)) which are arranged in recesses in the base part (as shown in figure 2) and react to the pressure in the pump chamber in order to alternately open and close an inlet channel and an outlet channel (nozzle and supply passage (14 and 15)) for a medium to be pumped, wherein the valves are formed without any common components by standalone functioning valve modules comprising a valve seat (valve seat (404)) and a valve body (401) (see module in figures 4C and 5C, and see columns 3-4 lines 50-2 for operation of valves).

, wherein the valve modules are comprised of a seat component forming the valve seat (valve seat (404) and ring-shaped fixing member (407) in figure 4A) and a spring component forming the valve body (doughnut-shaped disc valve (401)), and wherein the seat component has a recess formed by a rim heightening of a floor plate (The upper portion of the ring shaped fixing member (407) serves as a floor plate upon which the valve rests. The outer rim of the fixing member has a heightened section that forms a recess where the valve can rest, see figure 4A and the labeled image below.), wherein the rim heightening is integrally connected with the floor plate (the heightened

Art Unit: 3746

portion is an extension of the rim of the fixing member), and wherein the spring component placed in the recess and located adjacent the rim heightening is centered by the rim heightening (since the rim heightening has the same diameter and height as the valve it would serve to center the valve when the valve is placed inside it), and wherein the spring component is connected with an annular rim portion to the floor plate (an annular rim of the valve is clamped between the floor plate (407) and the valve seat).

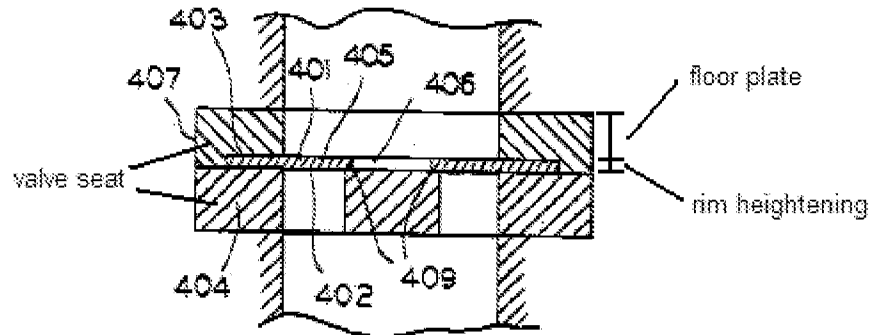


FIG. 4A

In Reference to Claim 2

Suga et al. teaches the micropump according to claim 1 (see the rejection of claim 1 above), wherein both valve modules are identically constructed (both valves can take the form of the embodiments shown in figures 3-10).

In Reference to Claim 3

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein hollows which are open toward the pump chamber are formed as recesses (See figure 2, where two recesses are used to hold the valves (22 and 21)).

Art Unit: 3746

In Reference to Claim 4

Suga et al. teach the micropump according to claim 3 (see the rejection of claim 3 above), wherein the height of the valve module is equal to the depth of the hollow receiving the module (See figure 2, where the top of the valves (22 and 21) sit flush with the inner chamber of the base (pressure chamber (13)) in which the recesses are formed).

In Reference to Claim 5

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the valve module (see figure 5C) is comprised of two parts with a rotationally symmetrical seat component (seat component (506) is rotationally symmetric about its central axis), and a valve body (valve member (511)) for closing and opening of a central opening in the seat component (see figures 5A and 5B).

In Reference to Claim 6

Suga et al. teach the micropump according to claim 5 (see the rejection of claim 5 above), wherein the spring component exhibits a film (the spring component (511) can be made from a plastic film (see column 5 lines 52-58)) in which a lip element (supporting arms (510)) is formed through at least one cutout (the portions of film that have been cutaway) and attached at one end or at several ends with the remaining film (the arms are attached to the center of the film and an outer rim of the film, see figure 5C).

In Reference to Claim 7

Art Unit: 3746

Suga et al. teach the micropump according to claim 6 (see the rejection of claim 7 above), wherein the cutout is a slot cutout following the contour of the lip element (The slots meet the edges of the lips (supporting arms (510)), and therefore follow the contour of the lips).

In Reference to Claim 8

Suga et al. teach the micropump according to claim 6 (see the rejection of claim 6 above), wherein the spring component is connected with the seat component in an outer ring area (peripheral stationary ring (503)) which is centered by the seat component, from which the lip element extends inwards (see figure 5C).

In Reference to Claim 11

Suga et al. teach the micropump according to claim 8 (see the rejection of claim 8 above), wherein the lip element is connected with the ring area at two diametrical places or connected with the ring area at three places which are evenly distributed across the ring area (The lip elements connect to the ring four times in such a way that each connection has a connection that is diametrically opposite).

In Reference to Claim 12

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein it is composed of a base module (printer head (10)) which receives the valve modules (see figure 2 with valve modules (21 and 22)) and comprises a base part (bottom of pressure chamber (103)) and hose connections (nozzle and supply passage (14 and 15) could be connected to hoses), and of a actuator module which

Art Unit: 3746

includes the membrane and a piezo disk (piezo electric element (11)) connected to the membrane (wall (12)).

In Reference to Claim 17

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein at least the part of the pump which comes into contact with the medium is made of a plastic (Suga et al. teach that the valves can be made from a plastic film (see column 5 lines 52-58)).

In Reference to Claim 18

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the membrane is made of one piece or exhibits several layers of different material. The wall is made of a cold-rolled stainless steel plate (see column 5 lines 64-65).

In Reference to Claim 19

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the membrane exhibits a recess facing the pump chamber, which preferably corresponds to the maximum pump chamber volume (When a voltage is applied to the piezoelectric element, the wall is curved and deformed, which would form a recess facing the pump chamber (see columns 2-3, lines 64-2)).

In Reference to Claim 20

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above), wherein the membrane is cap-like and can be moved manually or with the help of an actuation which is temporarily or permanently attached to the membrane

Art Unit: 3746

(The membrane forms a cap for the pressure chamber (103) and is moved by a electromechanical transducer means (101) which is fastened to the wall (102) (see columns 2-3 lines 64-2)).

In Reference to Claim 21

Suga et al. teach a method for the serial production of micropumps according to claim 1 (see the rejection of claim 1 above), wherein the valve modules, base modules, which include the base part and connections, as well as the actuator modules which include the membrane, are prefabricated independently of one another and wherein the micropump is made up of these modules (The valves shown in figures 4C and 5C are created separately from the base (103), which is created separately from the wall (102) and piezo actuator (102). These components are then assembled together to form the apparatus).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. in view of U.S. Patent 4,966,185 to Schram (Schram).

In Reference to Claim 9

Art Unit: 3746

Suga et al. teach the micropump according to 5 (see the rejection of claim 5 above), but does not teach that the center of the valve seat has a raised portion.

Schram teaches a similar style valve (see figure 6A) where a center portion of the valve base (outer plate (4)) is raised around the around the central valve body portion (18). It would have been obvious to one of ordinary skill in the art at the time of invention to raise the central portion of the valves of Suga et al. in the manner of Schram to ensure that the valves remain closed when not experiencing fluid pressure and to prevent leakage of the pumped fluid.

In Reference to Claim 10

Suga et al. as modified by Schram teaches the micropump according to claim 9 (see the rejection of claim 9 above), wherein the seat component has an elevated rim seat by means which the lip element is lifted across its entire length from the floor plate (see figure 6A of Suga et al. where the lower valve seat (604) elevates the film with respect to the inner portion of the valve seat (606)).

7. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al. in view of U.S. Patent 5,718,567 to Rapp et al. (Rapp et al.).

In Reference to Claim 13

Suga et al. teach the micropump according to claim 11 (see the rejection of claim 11 above), but do not specify the shape of the base module.

Rapp et al. teach a similar diaphragm pump where the base surrounds a disk shaped diaphragm (see diaphragm (2) shown in figure 3a). Because of this, the lower

Art Unit: 3746

pump body (1) and the upper pump body (3) are both annular in shape and rotationally symmetric about the center of the diaphragm. It would have been obvious to one of ordinary skill in the art at the time of invention to form the base of Suga et al. in the shape of a circle so that it could be used in conjunction with a circular pumping wall or diaphragm.

In Reference to Claim 14

Suga et al. teach the micropump according to claim 1 (see the rejection of claim 1 above) where the base part has a disk place (the upper rim of the printer head (10), where the pump membrane disk (12) is secured to the pump body), but do not teach that the base is disk shaped, or that the inlet and outlet channel extend perpendicularly to the plane of the disk.

Rapp et al. teach a similar diaphragm pump where the base surrounds a disk shaped diaphragm (see diaphragm (2) shown in figure 3a). Because of this, the lower pump body (1) and the upper pump body (3) are both annular in shape and rotationally symmetric about the center of the diaphragm. It would have been obvious to one of ordinary skill in the art at the time of invention to form the base of Suga et al. in the shape of a circle so that it could be used in conjunction with a circular pumping wall or diaphragm.

Additionally, Rapp et al. teach that the inlet and outlet channels (11 and 12) lie perpendicular to a plane defined along the bottom of the base (1). It would have been obvious to one of ordinary skill in the art at the time of invention to form the inlet and outlet channels of Suga et al. such that they extend vertically through the pump base, in

Art Unit: 3746

the manner taught by Rapp et al., since doing so would allow excess pump fluid trapped in the channels to leak back into the tank reservoir or out through the nozzle.

In Reference to Claim 15

Suga et al. as modified by Rapp et al. teaches the micropump according to claim 13 (see the rejection of claim 13 above), wherein a seat for the actuator module is formed on the base part (upper annular ring of pressure chamber (103) forms the seat for wall (12), as seen in figure 2 of Suga et al.), and the pump membrane rests over a support ring on a ring shoulder located on the base part (the ring shoulder is the upper portion of the base (103)).

In Reference to Claim 16

Suga et al. as modified by Rapp et al. teaches the micropump according to claim 13 (see the rejection of claim 13 above), wherein the base module is formed in one piece with the hose connections (see figure 2 of Suga et al., where the nozzle and supply passages (14 and 15) could be used as hose connections).

Response to Arguments

8. Applicant's arguments filed 8/18/08 have been fully considered but they are not persuasive. Applicant argues that the relied upon reference (Suga et al.) does not meet the requirements of claim 1, since it is not automatically centered by a heightened rim area of the valve seat. However, the examiner asserts that, when both the floor plate and the clamping ring are considered to be the valve seat, that the valve seat does have a heightened rim (see the labeled figure below). Furthermore, since both the valve and

Art Unit: 3746

the heightened rim have the same diameter and height, when the valve is inserted in the floor plate, the rim portion would automatically center the valve. Thus the apparatus of Suga et al. does meet the requirements of claim 1, and applicant's arguments pertaining to how the valve is attached to the valve seat are moot, since these requirements are not included in the claims.

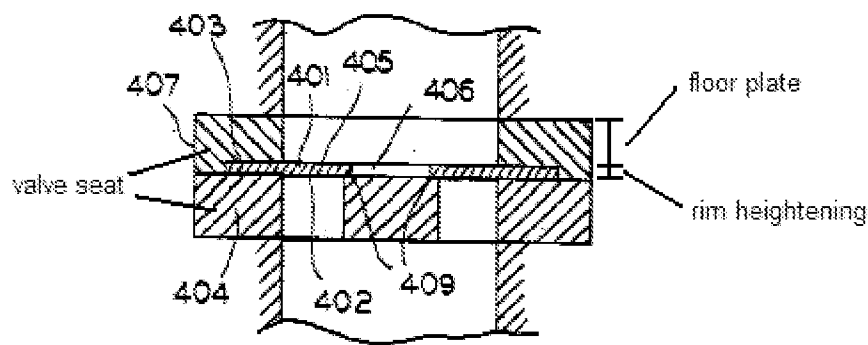


FIG. 4A

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 3746

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

Application/Control Number: 10/527,207
Art Unit: 3746

Page 14

/JLM